NATURAL RESOURCES CONSERVATION SERVICE
PACIFIC BASIN AREA
CONSERVATION PRACTICE STANDARD

# CLEARING AND SNAGGING

(Meters and Feet)
CODE 326

## DEFINITION

Removing snags, drifts, or other obstructions from a channel.

## PURPOSE

- To increase the flow capacity of a channel by improving its flow characteristics; to prevent bank erosion by eddies; to reduce the forming of bars; and to minimize blockages by debris.
- Special attention shall be given to restoring, maintaining or improving landscape resources and habitat for fish and wildlife, where applicable.

## CONDITIONS WHERE PRACTICE APPLIES

Any channel or floodway where the removal of trees, brush, and other obstructions is needed to accomplish one or more of the listed purposes. If clearing and snagging are likely to result in channel erosion, impairment to the landscape resource quality, or impairment to habitat for fish and wildlife, either the clearing and snagging shall not be done or practices to minimize such damages shall be applied concurrently with the clearing and snagging.

## DESIGN CRITERIA

The capacity of the channel, both before and after improvement, shall be determined by use of Manning's Formula, using applicable values of the retardance factor "n," for both conditions. Manning's "n" values and open channel hydraulics information are found in the NEH Part 650 (EFH) Chapter 3 - "Hydraulics" or NEH Part 630 (Hydrology) NRCS TR 61 "Handbook of Channel Design for Water Conservation." The value of "n" used to determine channel capacity after improvement shall reflect the degree of maintenance expected in future years.

The area to be cleared and snagged shall include the perimeter of the channel, the flow area of the floodway, or both. Adjacent trees or other objects that may fall into the channel shall also be included. Clearing and snagging may be specified for other areas, including berms, for use as temporary disposal areas or travel ways, or for planned conservation uses.

Channel stability shall not be impaired by clearing and snagging. The criteria for determining channel stability, as established in the Pacific Basin standard Open Channel (582) shall be complied with. The effect of removing obstructions on downstream reaches shall be considered.

## PLANNING CONSIDERATIONS FOR WATER QUANTITY AND QUALITY

### QUANTITY

Possible downstream flooding.

Effect of changed drawdown on bank stability.

Effect of changed flow conditions on ground water recharge.

### QUALITY

Effects of discharge on the flood plain and channel relative to erosion and sediment production, both during construction and after establishment.

Effects sediment load, sediment-attached substances, organic loadings.

Relationships between stream quality and aquifer quality where ground water recharge occurs.

Temporary and long-term effects on visual quality of water and landscape.

ffects on onsite and downstream water temperatures.

## PLANS AND SPECIFICATIONS

Plans and specifications for clearing and snagging shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Construction plans shall be developed under guidelines provided in the NEH Part 650 - EFH Chapter 5 - "Preparation of Engineering Plans."

Preliminary to developing design and construction plans, survey data shall include sufficient points to develop and show plan, profile, cross sections, location of physical features (roads, trees, buildings, watercourses, etc.) and stock piles. All surveys will be in accordance with NEH Part 650 EFH -Chapter 1 and NEH Part 640 Field Surveys - Technical Release 62.

Construction plans shall include a to scale plan view, profiles, and spoil disposal requirements as a minimum. If additional conservation practices are included in the project, the information necessary to construct these practices will also be conveyed on the plans.

**As-Built-Plans.** As-Built-Plans, when required by the approving individual, shall reflect all significant changes in alignment, cross section, structure location, etc. It is expected that all changes will be with prior consent of the individual approving the design. If there were no changes, the original drawings shall be marked, "As-Built."

## CLEARING AND SNAGGING SPECIFICATIONS

All trees, stumps, and brush to be removed within the perimeter of the channel shall be cut as close to the ground as the cutting tools permit. If other areas are to be cleared, the trees, brush, and other woody vegetation shall be cut within the maximum distance above the ground level specified.

Trees shall be felled in such a manner as to avoid damage to other trees, property, and objects outside the limits of clearing.

Down trees, logs, drifts, boulders, debris and other obstructions lying wholly or partly in the channel shall be removed. Piling, piers, headwalls, and sediment bars that obstruct the free flow of water shall be removed if so designated in the drawings.

If herbicide treatment is planned, the stumps and brush in the specified area shall be treated at the time of clearing according to the recommendations of the manufacturer of the herbicide specified or being used.

The use of explosives in all clearing and snagging operations shall be in strict compliance with applicable state statutes and regulations.

If channels are located in cultivated areas or in areas of high value land, trees, logs, and all combustible material resulting from the clearing and snagging operations shall be burned, buried, or piled in designated disposal areas as specified. All burning shall be performed outside the channel and shall conform to regulations in effect in the area. In other areas, such as woodland or rangeland, where burning is prohibited, material shall be disposed of in such a manner that it does not float away or reenter the channel. Residue from burning and noncombustible material shall be buried outside the channel or placed in designated disposal areas. All buried material shall have an adequate earth cover to permit proper land use.

Selective snagging, where possible, shall be performed primarily with hand-operated equipment, water-based equipment, or small equipment used in a manner that will minimize soil, water, and other resource disturbances.

This practice may adversely affect cultural resources. Planning, installation and maintenance must comply with GM 420, Part 401.

Measures and construction methods that enhance fish and wildlife values shall be incorporated as needed and practical. Special attention shall be given to visual resources, protecting and maintaining key shade, food, and den trees and to stabilization of disturbed areas.

## OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed that is consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for its design.

## REFERENCES

1. USDA NRCS, National Engineering Handbook Part 630, Hydrology
2. USDA NRCS, National Engineering Handbook Part 640, Field Surveys (Technical Reference 62)
3. USDA NRCS, National Engineering Handbook Part 650, Engineering Field Handbook